

REMARKS

Claims 1, 3-14, and 20-28 are pending in this application. Claims 5-8 are withdrawn from consideration as being drawn to a non-elected species, there being no presently allowable generic or linking claim. Claims 2, 15-19 have been canceled.

Claim 1 was rejected under 35 USC 112, second paragraph, for indefiniteness because the Examiner alleges that it is unclear what is meant by "time of light" in the limitation "to provide an equal passage of time of light thereto". Claim 1 is now presently amended to delete this language so as to overcome the 112, second paragraph, rejection. Accordingly, the Examiner is requested to reconsider and withdraw the rejection.

Claims 1, 3, 4, 9-12, 21, 23-26 and 28 were rejected under 35 USC 102(e) as being anticipated by *Kudo*. Claims 13 and 22 were rejected under 35 USC 103(a) as being unpatentable over *Kudo* in view of *Towe et al.* Claim 20 was rejected under 35 USC 103(a) as being unpatentable over *Kudo* in view of *McFarlane et al.* Claims 14 and 27 were rejected under 35 USC 103(a) as being unpatentable over *Kudo* in view of *Mazed*.

Claims 1 and 28 comprise independent claims from which all other claims presently pending depend.

Claim 1 is now amended to additionally recite an input waveguide region located between the semiconductor laser region

and the multi-mode interference region, the input waveguide region including a plurality of wave-guiding portions where all the wave-guiding portions are equal in length in an optical direction. Such an amendment to claim 1 clarifies the structure of the claimed semiconductor laser element shown, for example, in Figure 6 of applicant's drawings. This feature eliminates any time difference in the travel of respective laser emissions so as to reduce or eliminate jitter when a high speed modulation voltage is applied.

It is respectfully submitted that *Kudo* fails to teach or suggest such a feature. *Kudo*, on the other hand, is directed to a multiple wavelength communication system, as evidenced by the teaching that the band gap wavelength can be basically controlled by changing the widths W_m and W_{m2} . Moreover, the band gap wavelength of each channel as shown in Figure 4 can be independently controlled (lines 3-6). Also the various embodiments state, for example, with respect to embodiment 2 at column 12, lines 39-42, "There is resultantly manufactured an 8-channel different wavelength semiconductor laser array...". See also, with respect to embodiment 4 at column 15, lines 31-36 where it states, "The wavelength can be changed in a range of from 1535 nm to 1550 nm for channels 1 to 8 in the DFB laser region". Furthermore, it is clear from Figure 18 of *Kudo* that

the optical multiplexer region, located between the DFB laser region and the MMI region does not include a plurality of waveguiding portions where all of the waveguiding portions are of equal length in an optical direction.

Independent claim 1 also recites a semiconductor laser region including a plurality of laser emission portions, each having the same construction relative to one another and arranged side-by-side in a parallel array. The advantage of this feature is that since the plurality of laser emission portions have the same construction and equal length waveguiding portions couple the active layers to the multi-mode interference region, jitter is substantially reduced or eliminated, which would otherwise be caused by an irregularity of active layers having different dimensions when high speed modulation signals are applied. *Kudo* fails to teach or suggest such a feature.

Kudo discloses a device where all of the laser portions are provided with individual electrodes so as to oscillate independently of one another. Therefore, it is impossible to generate the same wavelength for all of the laser portions, particularly in the case of high speed modulation. Such a configuration causes jitter due to phase difference of the generated signals.

The Examiner contends that the intended use limitation "so as to provide an equal passage of time of light thereto from the active layers" does not structurally distinguish the claimed invention over the prior art. It should be noted that this phrase is now removed from independent claim 1. Accordingly, the applicant submits that it is in the structural features described above as recited in amended claim 1 that distinguishes over *Kudo* so as to provide the resulted advantages as described above.

With respect to the secondary references, *Towe et al.* merely discloses the concept of wave-guiding layers being formed of AlGaAs. *McFarlane et al.* merely discloses the concept of a fully receptive dielectric layer located between a laser active region and a waveguide region. *Mazed* discloses the concept of applying a modulation signal to a laser chip via a plurality of discrete RF OC transmission lines. It is submitted that these references do not make up for the deficiencies of *Kudo*.

With respect to independent claim 28, it is similar to independent claim 1, with the addition of a common modulation electrode traversing all of the laser emission portions for operating the laser emission portions in a single mode and wherein each of the laser emission portions also have an active layer which perform laser operations at the same wavelength, and

wherein the active layer of the plurality of laser oscillation portions, the first wave-guiding layer of the multi-mode interference region, the second wave-guiding layers of the input waveguide region, and the third wave-guiding layer of the output wave-guiding regions are formed on a common substrate.

It is respectfully submitted that claims 1 and 28 as presently amended patentably define over the prior art and are not obvious to one skilled in the art without improper hindsight provided by applicant's own disclosure. It is submitted further that the dependent claims depending from claims 1 and 28 become allowable by virtue of their dependency from independent claims.

Therefore, all of the claims now remaining in the application are deemed to be in condition for allowance and, therefore, further and favorable action is requested.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact William L. Gates (Reg. No. 20,848) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

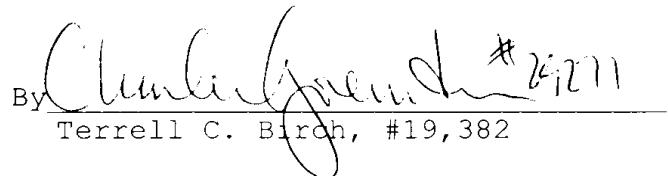
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Appl. No. 09/670,820

required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment(s)